

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
4 August 2005 (04.08.2005)

PCT

(10) International Publication Number
WO 2005/069825 A2

(51) International Patent Classification: Not classified

(21) International Application Number:
PCT/US2005/001103

(22) International Filing Date: 13 January 2005 (13.01.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/538,131 21 January 2004 (21.01.2004) US
10/925,600 24 August 2004 (24.08.2004) US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:
US 10/925,600 (CIP)
Filed on 24 August 2004 (24.08.2004)

(71) Applicant (for all designated States except US): **SEN-GUPTA, Arup, K.** [US/US]; 3286 Marchant Drive, Bethlehem, PA 18017 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **CUMBAL, Luis, H.** [EC/EC]; Avenida Cardenal de la Torre, S-12-74 Quito, Ciudadela Primero de Mayo (EC).

(74) Agents: **SMITH, George, A., Jr.** et al.; Howson and Howson, Spring House Corporate Center, P.O. Box 457, Spring House, PA 19447 (US).

(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US (patent), UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF MANUFACTURE AND USE OF HYBRID ANION EXCHANGER FOR SELECTIVE REMOVAL OF CONTAMINATING LIGANDS FROM FLUIDS

(57) Abstract: Polymeric anion exchangers are used as host materials in which hydrated Fe (III) Oxides (HFO) are irreversibly dispersed within the exchanger beads. Since the anion exchangers have positively charged quaternary ammonium functional groups, anionic ligands such as arsenates, chromates, oxalates, phosphates, phthalates can permeate in and out of the gel phase and are not subjected to the Donnan exclusion effect. Consequently, anion exchanger supported HFO micro particles exhibit significantly greater capacity to remove arsenic and other ligands in comparison with cation exchanger supports. Loading of HFO particles is carried out by preliminary loading of the anion exchange resin with an oxidizing anion such as MnO_4^- or OCI^- , followed by passage of a Ferrous Sulfate solution through the resin.



WO 2005/069825 A2